WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005MT67B

Title: STUDENT FELLOWSHIP: Clonal recruitment of Populus angustifolia along the Yellowstone River: extent and requirements

Project Type: Research

Focus Categories: Ecology, Surface Water, Management and Planning

Keywords: clonal, cottonwood, floodplain

Start Date: 03/15/2005

End Date: 06/30/2006

Federal Funds: $5,000

Non-Federal Matching Funds: $0

Congressional District: At Large

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Abstract

The Problem

The regional water problem encompasses a lack of understanding concerning riparian cottonwood trees and its establishment in floodway and floodplain environments. This is because the scientific knowledge about clonal recruitment is very limited even though it accounts for 50 to over 80% of the reproduction occurring on the few systems studied so far (Rood et al. 1994; McKay 1996; Gom and Rood 1999; Roberts 1999). Reasons why there is limited knowledge of asexual reproduction compared to sexual reproduction are; trees longevity, large size, and woody nature. The study of clonal recruitment of cottonwood trees has been limited in the past as well because of the problem posed by ways of identifying the vegetative propagules. Clone detection methods have included; excavation, phenology, plant morphology, and protein electrophoresis but results have not been widely accepted because of problems with accuracy rates with these methods and age limitation of samples. Now with the development of molecular analysis (DNA) especially microsatellite analysis this is no longer a limiting issue. Understanding

vegetative reproduction in the riparian cottonwood biology is especially crucial because the vast majority of wildlife and fish habitat exists in these areas (Hansen et al. 2003, Bowen et al. 2003). The ability to manage a system relies on in-depth knowledge of the biology of the system. A knowledge of the complete reproduction cycle, not just half of it, will allow sound judgment decisions to be made affecting the riparian ecology. Because private ownership is, about eighty percent of floodplain land along the Upper Yellowstone River it is critical to investigate the mechanisms involved for the establishment of cottonwoods and share that information with landowners as well as with the scientific community.